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Examiner: Minsun Oh Harvey
Art Unit: 2644

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APPEAL BRIEF

REAL PARTY IN INTEREST:

Applicant

RELATED APPEALS AND INTERFERENCES:

None

STATUS OF CLAIMS:

Claims 8-17, 28, 32-36 and 39 rejected under 35 U.S.C. 112, first paragraph.

Claims 1-53 rejected under 35 U.S.C. 102(b) as anticipated by Kirby GB 2269968.

The rejections of all claims is appealed.

STATUS OF AMENDMENTS:

Amendment to Claim 21 to correct a typographical error was made in a response on October 2, 2001. No response to this amendment has been received to date, consequently the status of this amendment is unknown. All other amendments have been entered and no other amendments are pending.

SUMMARY OF INVENTION:

The invention is for an improved IFB (Interrupted Feed Back) system. In on site television reporting (for example live news stories), the on site reporter receives an audio signal (in an earpiece or headset) from the television station which audio is a mixture of the audio which the station is broadcasting as well as instructions from the television director (located in the station). This IFB signal typically is sent from the station to the reporter via cell phone or radio transmission. A typical instruction from the director might be given during a commercial to alert the reporter to get ready to come back live with his/her report at the end of the commercial. The reporter then listens to the commercial audio to determine when the commercial ends and thus when to start the report.

An unfortunate consequence of a typical IFB is that as soon as the reporter starts the report, his/her own voice (which is then being broadcast)is directed back to them via the IFB. This audio is often delayed by a considerable amount. Hearing their own voice delayed is very disconcerting and often causes the reporter's presentation to be upset, or causes the reporter to remove the IFB headphone thus losing the ability to hear instructions from the director.

The present invention is a novel apparatus and method for removing the reporter's delayed voice from the IFB signal thus preventing the disconcerting presence of their delayed voice. The preferred embodiment of the invention operates by receiving the reporter's voice directly

from the reporter's microphone (local voice), delaying that local voice signal to match the delay of the voice which is returned via the IFB signal, and combining the delayed local voice with the IFB signal to reduce or cancel out the reporter's delayed voice in the IFB. Manually adjustable and various automatically adjusted embodiments of the invention are taught, along with other novel features which may be utilized with the invention.

Of particular note, the present invention operates over a large correction range while requiring only 1 variable delay and 1 cancellation circuit whereas the prior art requires the use of 2 (or three under the examiner's interpretation) variable delays and 2 circuits to adjust delays to achieve cancellation.

ISSUES:

1) Whether Claims 8-17, 28, 32-36 and 39 are unpatentable under 35 U.S.C. 112, first paragraph as being based on a nonenabling disclosure in regard to the element pertaining to "correlation".

2) Whether Claim 39 is unpatentable under 35 U.S.C. 112, first paragraph as being based on a nonenabling disclosure in regard to the step pertaining to "pitch correction".

3) Whether each Claim 1-53 is unpatentable under 35 U.S.C. 102(b) as anticipated by Kirby GB 2269968.

4) Whether the examiner has established a proper record supporting the rejections above under 37 C.F.R. 1.104, and in particular 37 C.F.R. 1.104(c)(2), last sentence.

GROUPING OF CLAIMS:

In respect to the rejection of Claims 8-17, 28, 32-36 and 39 as unpatentable under 35 U.S.C. 112, first paragraph, with respect to "correlation" these Claims recite correlation of dif-

ferent pairs of signals as taught in the specification and thus each Claim stands alone as explained in further detail below, i.e. the Claims do not stand or fall together.

In respect to the rejection of Claim 39 as unpatentable under 35 U.S.C. 112, first paragraph, with respect to "pitch correction" this Claim stands alone.

In respect to the rejection of Claims 1-53 as unpatentable under 35 U.S.C. 102(b) as anticipated by Kirby, GB 2269968, each of these Claims stands alone as explained in further detail below, i.e. the Claims do not stand or fall together. It may be noted that groups of claims have common or similar elements which, with respect to that common or similar element, would cause the respective group to be allowable. Appellant has accordingly grouped these claims under the arguments to aid in review.

ARGUMENT

Attention is called to Applicant's declaration in support of the arguments presented herein, which declaration was submitted with the October 2, 2001 response.

Rejection of Claims 8-17, 28, 32-36 and 39 under 35 U.S.C. 112

Claims 8-17, 28, 32-36 and 39 were rejected under 35 U.S.C. 112 first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The examiner explains "Correlation circuit which has been claimed in Claims 8-17, 28, 32-36 and 39 do not read on figure 2". Applicant believes that it is not necessary that the correlation circuit be specifically enabled in Figure 2 as it pertains to an improved and more detailed version of the generic invention, which detailed version is shown in Figure 3. The improvements, including the various correlations of pairs of audio signals, fall within the teachings of the invention which is described with respect to Figure 2 however.

The examiner agrees that Claim 1 is generic to the (non prior art) Figures (page 14, line 9 of 10/12/00 office action):

> Also, the examiner agrees that Claim 1 is generic. When Claim 1 becomes allowable, these dependent claims would be allowable.

Applicant believes apparatus Claims 2 and 3, and corresponding method Claims 20-22 are also generic. The examiner agrees that there is one invention covered by generic Claim 1 which covers both the simpler species of Figure 2 and the more complex embodiment of Figure 3.

This admission by the examiner as to Claim 1 being generic is important in respect to the Figures pertaining to commonality of any separate species, to the extent the examiner believes they exist. At MPEP 806.04(d), second paragraph, second sentence:

> In general, a generic Claim ··· must comprehend within its confines the organization covered in <u>each</u> of the species [emphasis added].

In admitting that Claim 1 is generic, the examiner admits Claim 1, comprehends the organization of both Figure 2 and Figure 3. Assuming arguendo the addition of the correlation circuit in the dependent claims would create a separate species (for example as shown by Figure 3), the claims would still be allowable as stated at MPEP 806.04(d) paragraph 4:

> Once a claim that is determined to be generic is allowed, all of the claims drawn to species in addition to the elected species <u>which include all the limitations of the generic claim</u> will ordinarily be obviously allowable in view of the allowance of the generic claim, since the additional species will depend thereon or otherwise include all of the limitations thereof [emphasis added].

Rejected dependent Claims 8-17 inherently contain all of the limitations of generic Claims 1-3. Similarly, rejected dependent Claims 28, 32-36 and 39 inherently contain all of the limitations of Claims 20-22 which are method Claims very similar to generic Claims 1-3 and thus also generic.

It is noted that Figure 3 is improved with respect to Figure 2, i.e. it includes the same elements 12, 13, 14, etc, but specifically shows correlate and adjust element 15 which may

perform the automatic delay adjustment of Figure 2. Independent Claim 1 recites common elements of Figures 2 and 3 (and 4) and dependent Claims 8-17 add the correlation feature (and others). The examiner has stated applicant's argument is not persuasive because the adjustment circuit of Figure 2 is not disclosed as a correlation and adjustment circuit, and Figure 3 is a second embodiment of the invention (top of page 8 in 8/28/01 office action). Applicant points out that a different embodiment may very well also be an improvement of the same invention, as in the present instance where element 15 provides correlation and adjustment improvement to the embodiment of Figure 2, which improved version is shown in Figure 3. For the reasons given above, it is believed that the examiner's position that Figure 3 is a different embodiment is moot.

In respect to enablement of the correlation circuit itself, the specification provides proper enablement under 35 U.S.C. 112, first paragraph. At page 15 of the specification, in respect to Figure 2, and in particular elements 16, 12 and 14, it is taught:

> "··· it is preferred to inspect either the IFB (or program) audio from 18, or the mix minus audio from 13 with the adjustment circuit 16, thus allowing adjustment of the delay 12 and/or gain 14 automatically in response to the signal(s). The inventive concepts of performing automatic adjustment will be described in more detail with respect to the preferred embodiment of **Figure 3**."

Figure 3 references all elements of Figure 2 except the microwave transmitter 19, i.e. elements 9, 10, 12, 13, 14, 16 and 18. Figure 3 shows to automatically adjust elements 12, 14 and 16 of Figure 2 by use of element 15. Accordingly, Figure 3 is a more detailed, automatic adjustment, version of Figure 2. The specification clearly teaches that Figure 3 describes performing automatic adjustment of the delay (by using correlation), which delay is also shown in Figure 2.

Element 16 is simply an adjustment control which allows the amount of gain or delay to be adjusted, however the adjustment itself is performed by 12 and 14. Simplistically stated,

Figure 2 shows adjustment of elements by automatic or manual means and Figure 3 shows details of automatic adjustment.

Element 15 is described in the specification, for example at page 16, second paragraph:

> The circuit of **Figure 3** shows inspection, for this example by correlation, and adjustment circuit 15a which operates to correlate the talent's microphone audio from 10 with the feedback audio (IFB or program) from 18 to determine the amount of delay of the talent audio contained in the signal at 18 and the necessary gain correction to provide the proper level of cancellation signal for the desired cancellation as established by 16. ··· Inspection circuits such as for example correlation circuits suitable for such use are known to those of ordinary skill in the art, for example as disclosed in U.S. Patent Re. 33,535 (4,703,355). The circuit of Figure 11 of this patent is of particular interest.

The correlation circuit element is admitted to be present in the prior art, namely in Re. 33,535. Figure 11 of Re. 33,535 shows a comparison of two audio signals 133 and 134 with a correlator 135 for determining the delay therebetween. Figure 11 is discussed in detail at column 15, line 9 et seq. In particular at lines 37 & 38 a commercially available component, a TRW TDC 1023 correlator, is given as an example which may be used as 135. Claim 39 of Re. 33,535 recites correlation of the signals. A copy of this patent was previously enclosed for the examiner's convenience.

MPEP 2164.01 at lines 20-24 states:

> The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation.

At lines 24 & 25 MPEP 2164.01 states:

> A patent need not teach, and preferably omits, what is well known in the art.

The present claimed invention utilizes novel combination and cooperation of elements, each of which was individually known in the art at the time of filing. One of these elements is the use of correlation of two audio signals to determine their relative delay. Clearly, the comparison of two audio signals to determine their delay, such as performed by correlation of two audio

signals, was well known in the art at the time of filing of the instant application as exhibited by the reference therein to Figure 11 of U.S. Patent Re. 33,535. Furthermore, as suggested in MPEP 2164.01 the instant application omits detailed teaching of the well known correlation circuit which is consequently enabled. No detailed description of it need be present in the specification.

Rejection of Claim 39 under 35 U.S.C. 112

Claim 39 was rejected as unpatentable under 35 U.S.C. 112, first paragraph, with respect to lack of enablement of "pitch correction". Claim 39 recites a novel combination of old elements, one of which is pitch correction. Pitch correction associated with variable delay as claimed in Claim 39 is well known in the art as is the fact that variable delays such as that claimed in Claim 39 cause pitch errors. In the present invention the variable delay deals with audio signals which inherently have pitch, or frequency, characteristics. The pitch changes as the variable delay changes. U.S. Patent 5,920,842 was referenced in the specification of the present invention, (column 1, lines 19-30) as teaching pitch correction. The '842 patent teaches the above relationship between variable delays of the type used in the present invention and pitch. The '842 patent describes in detail that when there is a decrease or increase in delay, the delayed signal undergoes a corresponding change in frequency, or pitch. The '842 patent teaches how this change in frequency, or pitch, may be corrected. Claim 28 of the '842 patent specifically claims changing the delay of an audio signal while correcting pitch artifacts which occur during the varying of the time period (of the delay).

Applicant believes that the Claim 39 element "pitch correction" is an old element well known in the prior art as evidenced by the teachings of the '842 patent, and as such is adequately enabled under 35 U.S.C. 112 by the reference thereto in the present specification. Claim 39 finds novelty in the particular recited combination and cooperation of elements, each

of which is individually well known in the prior art, but which combination and cooperation was previously unknown.

MPEP 2164.01 at lines 20-24 states:

> The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation.

At lines 24 & 25 the MPEP states:

> A patent need not teach, and preferably omits, what is well known in the art.

Clearly, the use of pitch correction in conjunction with a variable audio delay was well known in the art at the time of filing of the instant application as exhibited by the reference therein to U.S. Patent 5,920,842. Furthermore, as suggested in MPEP 2164.01 the instant application omits detailed teaching of what is well known in the art. Clearly the pitch correction is well known, and consequently enabled; no detailed description need be present in the specification.

Rejection of Claims 1-53 under 35 U.S.C. 102(b)

Claims 1-53 were rejected under 35 U.S.C. 102(b) as being anticipated by Kirby. Kirby teaches a device for performing the same function of generating a mix minus signal. Kirby has similarities such as a talent signal 12, feedback signal 14 and mix minus signal 34. Applicant points out that Kirby has two variable delays 21 and 22 which are both responsive to the talent signal 12 and the feedback signal 14. There is no teaching in Kirby to make either delay responsive to any other signal such as the mix minus signal 34.

The examiner interprets Kirby's elements 22 and 32 as performing adjustment of automatic variable delay of the talent signal. The examiner points to elements 10 and 32 as controlling delays; 10 as controlling delay 22 and element 32 as controlling its own delay. At the outset, it is noted that under the examiner's interpretation Kirby has a total of 3 variable delays, 21, 22 and 32, as well as two delay controlling elements 10 and 32. By contrast, appli-

cant's claimed invention requires only 1 variable delay to delay the talent signal, and 1 control element for that variable delay. Applicant's claimed invention does not need to use Kirby's two variable delays for the talent signal (22 and 32), or the adaptive filter 32. Kirby also utilizes variable delay 21 to delay the feedback signal 14. Applicant's claimed invention does not need Kirby's feedback signal delay 21. Applicant's invention is simpler, and may be operated using only one variable delay rather than Kirby's 2 (or 3 by the examiner's interpretation of 32), it is structurally and functionally a different invention.

These and other distinctions are brought out in the claims. The different number of variable delays is brought out in the claims as an absence of variable delay of the feedback signal (i.e. absence of 21 of Kirby), a feature which the examiner has agreed is not found in the prior art of record (third paragraph of page 7 of 4/11/01 office action). In the last (final?) office action of 8/28/01, the examiner stated applicant's argument in this regard is not persuasive because the claims do not Claim the absence of the variable delay of the feedback signal (lines 6-10 page 8). Applicant respectfully disagrees with the examiner's position in that the signal 14 is applied to the combiner 40 by use of variable delay 21, whether the delay is actually varying at the time or not. Furthermore, if the delay 21 were removed, or considered not to be variable, the invention of Kirby would not operate, thus there is a teaching away from substituting a fixed delay or no delay at all for 21.

Applicant disagrees with the examiner's interpretation of element 32. Kirby teaches that the "adaptive cancellation circuit 30 automatically corrects for any remaining small delays between the signals" (second paragraph at page 4) and describes that this is done by "with the situation where more severe phase or amplitude effects are being introduced, ... it may be beneficial to employ several adaptive cancellation circuits operating in parallel as shown in Figure 2" (third paragraph of page 5). Kirby specifically teaches using "two identical filter

banks 41 and 42, or similar units, are employed ··· , and are located after the delays 21, 22 to avoid the need to duplicate the delays" (emphasis added) .

Adaptive filter 32 "comprises a series of one-sample delays arranged to provide simultaneously a sequence of adjacent samples, multipliers for multiplying the sample values by respective filter coefficients, and combining circuits for adding the outputs of the multipliers" (last paragraph of page 6). Kirby's 32 does not provide variable delay as in applicant's Claims, and thus does not perform variable delay in response to the mix minus signal (Kirby's 34) as claimed in several of applicant's Claims. In respect to 32 providing variable gain to the talent signal 12, to the extent that it might do so it applies the gain only to the delayed version of the talent signal, not to the undelayed version.

All of the Claims 1-53 contain elements, limitations or other distinctions which are not found in or fairly suggested by Kirby. Various ones of these elements, limitations and other distinctions are pointed to below with respect to the corresponding Claims.

The second paragraph of independent Claim 1 calls for:

> said feedback signal and said cancellation signal being applied to a combining circuit to provide said mix minus signal with said feedback signal being applied **without the use of a variable delay circuit**.

The examiner asserts that Kirby's variable delay 21 may not change delay at a particular instant. At page 6, column 2, lines 2 & 3 Kirby teaches to change the delays 21 and 22 as changes in the relative delay of the incoming signals are detected. However even if the delay 21 would not change for an instant, Kirby's mixed signal 14 is nevertheless **delayed and applied to** the combiner 40 **by use of the variable delay circuit 21**. Claim 1 does not say that the signal is applied without varying the delay, rather the Claim calls for the signal to be **applied without the use of** a variable delay circuit. There is no suggestion to one of ordinary skill in the art found in Kirby to eliminate variable delay 21 and apply the mixed signal 14

directly to 40. Indeed Kirby would not operate without his second variable delay 21.

Similarly, independent Claim 2 calls for "said feedback signal and said cancellation signal being applied to a combining circuit to provide said mix minus signal with said feedback signal being applied without the use of a variable delay circuit".

Also, independent Claim 3 calls for "said feedback signal being applied without the use of a variable delay circuit".

Independent Claims 1-3 call for the feedback signal (Kirby's 14) to be applied to a combining circuit (Kirby's 40) without the use of a variable delay circuit. This is believed to be a patentable distinction over Kirby which can not operate without the variable delay 21.

Independent Claim 20 specifies that "said feedback signal is combined without additional variable delay beyond said variable amount".

Independent Claim 21 specifies that "said feedback signal receives no variable delay beyond that as part of said broadcast transmission".

Independent Claim 22 specifies that "said feedback signal suffers no variable delay beyond that as part of said broadcast transmission".

Kirby's device does not meet the limitations of Claims 20-22 because of the additional variable delay of the feedback signal by element 21. It might be noted that the claim language is not restricted to a specific instant in time, rather one of ordinary skill in the art would recognize and know that the claims pertain to the overall operation of the invention, rather than a brief selected instant of operation.

Claims 40, 43, 46, 49 and 50 all recite a parameter or adjustment in an "amount set by a human operator" which is not taught by Kirby. The examiner points the Kirby's automatically set delay 22 as being set by a human operator, but does not provide any support from Kirby's teachings for this position. Kirby's description of 22 consistently characterizes 22 (and 21)

as an automatically variable delay in which the amount of delay is responsive to 10. There is no suggestion to make 22 (or 21 or 32) responsive to an operator.

It is noted that while in the 8/28/01 office action the examiner has (finally?) rejected all Claims 1-53 under 35 U.S.C. 102(b), no specific rejection is made with respect to Claims 4-19, 23-39, 41, 42, 45, 47-48, 51-53, nor does the examiner point to where the features of those Claims are found in Kirby. These Claims are believed allowable for the reasons given above, and further including the reasons provided below.

Claim 5 calls for the amount of delay of the talent signal (Kirby 12) to be responsive to the mix minus signal (Kirby 34). The examiner asserts that the adaptive filter 32 is a variable delay. Applicant believes however that the adaptive filter is a fixed tapped shift register with only the multiplier coefficients of the taps being varied. This operation is taught in respect to Kirby Figures 3 and 4. Kirby's delay element for the talent signal is element 22 which is responsive to the signals 12 and 14 as measured by 10, rather than to the mix minus signal 34.

Claim 5 also calls for the amount of gain of the talent signal to be responsive to the feedback signal (Kirby 14). In Kirby, assuming arguendo that 32 provides gain adjustment, the amount of gain is responsive to the mix minus signal 34.

Claim 6 calls for the amount of delay and gain of the talent signal to be responsive to the feedback signal. In Kirby the amount of gain, to the extent it may be provided by 32, is responsive to the mix minus signal.

Claim 7 calls for the amount of delay and gain to be responsive to the mix minus signal. In Kirby the amount of delay is only responsive to the talent and feedback signals.

Claims 8-17, 28 and 32-36, call for a correlation circuit in various combinations which correlate the locally produced audio talent signal with the audio talent signal which is returned from the station with the correlation being in direct (comparison of talent and feedback signal)

or recursive (comparison of talent and mix minus signal) form to determine or otherwise respond to the delay therebetween. There is no corresponding audio delay responsive correlation circuit in Kirby. It is noted that Kirby does suggest (1st paragraph at page 4) that delay measuring system 10 may utilize "The Phase Correlation Image Alignment Method" by Kuglin and Hines, which paper shows an image or video phase alignment technique which utilizes the phase of the two images. The Kuglin & Hines paper does not enable one of ordinary skill in the art to utilize phase correlation of images for measuring the delay of audio signals, and teaches away from the use of correlation such as taught in RE 33,535 for measuring such delay.

Even assuming arguendo that Kuglin somehow enables the use of his phase correlation technique for audio signals, one of ordinary skill in the art would know that a phase measurement is not a delay measurement, as phase is a cycle to cycle characteristic which repeats as signals are offset in time. By contrast, delay is a linear measure which uniformly increases as signals are offset in time. If one measures the relative phase of two signals, it can not be known what the relative delay of the two signals is. For example if the signal period is 16 milliseconds (a typical number for images in a video signal) and the phase is 180 degrees, the delay could be any multiple of the period plus 180 degrees, i.e. 8 ms, 24 ms, 40 ms, etc.. Consequently, the Kuglin technique, even if it were to be converted to audio, is a phase measurement technique which the person of ordinary skill in the art would know is unsuitable for use as applicant's claimed delay measurement.

Applicant supplied the Kuglin and Hines paper in the August 20, 1997 response where the Kirby reference was also supplied. Applicant noted in that response that the Kuglin paper "discusses a method of accurately performing registration of fixed but displaced images, particularly in correlating displaced aerial photographs". Applicant also pointed out that it was

unclear "how this paper teaches, suggests, or is even remotely related to the need to measure delay of two similar audio signals" as in applicant's claimed invention. The examiner has not refuted this observation, and has merely rejected applicant's Claims which call for correlation of two audio signals, in respect to Kirby's patent which merely suggests the use of image registration. It is believed that on of ordinary skill in the art would be directed away from the claimed use of correlation of two audio signals by the Kuglin reference which teaches image registration techniques.

Claims 1, 5, 7 and 19 call for operator adjustment of delay or gain. The examiner has pointed to adjustment caused by the mix minus signal being fed back to the filter 32 of Kirby, however the examiner has not pointed to where an operator causes the adjustment. One of ordinary skill in the art would understand the Claim limitation of operator adjustment to refer to an adjustment by a person such as "the talent or other operator" of the device as described in the present specification, for example at the middle of page 14 of the disclosure. One of ordinary skill would not consider the automatic adjustment of 32 which is caused by the mix minus signal to be operator adjustment as claimed. The examiner has provided no indication of how Kirby's teachings would suggest otherwise.

Claims 20-22 in step d) call for combining the feedback signal with the cancellation signal without additional variable delay beyond the amount arising from its passage through a broadcast transmission. Kirby adds additional variable delay.

Claim 24 calls for varying the delay (of the talent signal) in response to the mix minus signal and varying the level in response to the feedback signal. In Kirby the delay is responsive to the talent and feedback signals.

Claim 25 calls for the level (of the talent signal) to be responsive to the feedback signal. In Kirby, to the extent that 32 adjusts the level it is responsive to the mix minus signal.

Claim 26 calls for varying the delay and level (of the talent signal) in response to the mix minus signal. In Kirby the delay is responsive to the talent and feedback signals.

Claim 27 calls for one of the varying delay amount and the level step to be responsive to the talent signal in delayed form. In Kirby the delay is responsive to the talent signal in undelayed form and the any level adjustment by 32 is responsive to the mix minus signal.

Claim 28 calls for one of the delay or level step to be responsive to correlation of feedback and talent signal wherein the talent signal is in delayed form. Kirby's delay measurement is responsive to the undelayed talent signal. Additionally the suggested correlation is phase correlation of an image which is not a delay correlation.

Claim 29 calls for at least one of varying delay and level (of the talent signal) to be responsive to the mix minus signal and talent signal in undelayed form. In Kirby the delay is responsive to the feedback and talent signal, and any level adjustment of 32 is responsive to the mix minus signal.

Claim 31 calls for at least one of varying delay and level (of the talent signal) to be responsive to the mix minus signal and talent signal wherein the talent signal has been gain adjusted. In Kirby the delay adjustment is responsive to the unadjusted talent signal and the feedback signal. Any adjustment of the gain by 32 is responsive to the mix minus signal.

Claims 32-34 call for the correlation of signals wherein the talent signal has been gain adjusted. Kirby's delay measurement is responsive to the unadjusted talent signal and the suggested correlation is phase correlation of an image which is not a delay correlation.

Claim 38 calls for adjusting the level in response to the mix minus signal and the talent signal in delayed form. To the extent Kirby adjusts level in 32, it is in response only to the mix minus signal.

Claim 39 calls for the use of pitch correction as part of the delaying step. Kirby does

not even suggest that pitch error is a problem, let alone suggest any correction.

Claims 41, 45, 47 and 51 call for the mix minus signal to intentionally include an audible residual amount of the talent signal. Kirby does not recognize that this is desirable, nor make any suggestion to achieve this feature.

Claims 42, 48, 49, 52 and 53 call for the amount of delay to be automatically changed from the amount set by the human operator to the expected amount of relative delay of the feedback signal when the relative delay changes. Kirby does not suggest any adjustment or setting by a human operator or any automatic change from such setting.

Record of Examination under 37 C.F.R. 1.104(c)(2), last sentence

The examiner has not disagreed with applicant's interpretation of the scope of the prior art, and has admitted that the prior art is missing one feature of many of the claims, namely that the prior art utilizes a variable delay prior to the combining of the feedback signal with the cancellation signal. The examiner has rejected the claims without "[t]he pertinence of [the] reference ··· clearly explained and each rejected claim specified" as set forth in 37 C.F.R. 1.104(c)(2), last sentence nor has the examiner "clearly articulate[d]" the rejections as set forth in MPEP 706. The examiner has not provided proper explanation of how the claims are construed to cover this (and other) missing features of the prior art. Missing from the record is a statement as to the level of ordinary skill in the art at the appropriate time. Also missing with respect to each of those claim elements pointed to above: a) what would be known or suggested to one of ordinary skill from the prior art, b) how the claim would be interpreted by the person of ordinary skill, c) why the evidence and arguments of record do not overcome the rejection.

The examiner appears to have not properly recognized that none of the elements, features and limitations pointed to above are found or fairly suggested to one of ordinary skill in the art in Kirby or any other prior art of record. At most the examiner has only made an

unsupported assertion that the particular elements are found in certain blocks of the prior art drawings, without pointing to or identifying any teaching in the reference which clearly explains the rejection as set forth in 37 C.F.R. 1.104 (c)(1). In many instances there has been no identification of where the claim element at issue is found. Claim elements for which no proper record has been established include the following:

Claims 1-3, 20-22: feedback signal applied/combined without variable delay.

Claims 40, 43, 46, 49 and 50: parameter or adjustment set by a human operator.

Claim 5: delay of the talent signal responsive to the mix minus signal.

Claim 5: gain of the talent signal responsive to the feedback signal.

Claim 6: amount of delay and gain of the talent signal responsive to the feedback signal.

Claim 7: amount of delay and gain responsive to the mix minus signal.

Claims 8-17, 28 and 32-36: correlation circuit in various combinations.

Claims 1, 5, 7 and 19: operator adjustment of delay or gain.

Claims 20-22: combining the feedback signal with the cancellation signal without additional variable delay.

Claim 24: talent signal delay responsive to mix minus signal and varying the level in response to the feedback signal.

Claim 25: talent signal level responsive to the feedback signal.

Claim 26: varying talent signal delay and level in response to the mix minus signal.

Claim 27: varying delay amount or level responsive to the talent signal in delayed form.

Claim 28: delay or level responsive to correlation of feedback and talent signal in delayed form.

Claim 29: varying delay or level of the talent signal responsive to the mix minus signal and talent signal in undelayed form.

Claim 31: varying talent signal delay and level responsive to the mix minus signal and talent signal wherein the talent signal has been gain adjusted.

Claims 32-34: correlation of signals wherein the talent signal has been gain adjusted.

Claim 38: adjusting level in response to the mix minus signal and the talent signal in delayed form.

Claim 39: pitch correction as part of the delaying step.

Claims 41, 45, 47 and 51: mix minus signal to intentionally include an audible residual amount of the talent signal.

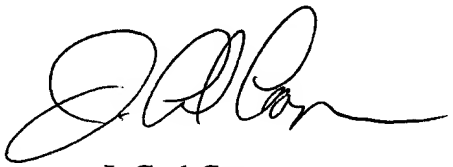
Claims 42, 48, 49, 52 and 53: amount of delay to be automatically changed from the amount set by the human operator to the expected amount of the feedback signal.

No specific record of the reason for rejection has been made with respect to Claims 4-19, 23-39, 41, 42, 45, 47-48, 51-53, nor does the examiner point to where the features of those Claims are found in Kirby.

Absent a clear record describing "[t]he pertinence of [the] reference" with each rejection "clearly explained and each rejected claim specified" as set forth in 37 C.F.R. 1.104(c)(2), last sentence or with "clearly articulate[d]" rejections as set forth in MPEP 706, the 35 U.S.C. 102(b) rejection is improper with respect to each claim 1-53.

Applicant requests reversal of the examiner's rejections of claims 1-53 and that the application be passed to allowance and issue.

Respectfully



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Reg. 34,568

APPENDIX

Claim 1 (twice amended) A system for providing a mix minus signal from a delayed feedback signal and a relatively undelayed talent signal including in combination:

a cancellation circuit responsive to said talent signal to delay said talent signal in a variable delay and to gain adjust said talent signal in delayed or undelayed form in a variable gain circuit thereby providing a cancellation signal, with the amount of said delay or gain responsive to human operator adjustment;

said feedback signal [without further substantial variable delay] and said cancellation signal being applied to a combining circuit to provide said mix minus signal with said feedback signal being applied without the use of a variable delay circuit.

Claim 2 (twice amended) A system for providing a mix minus signal from a delayed feedback signal and a relatively undelayed talent signal including in combination:

a cancellation circuit responsive to said talent signal to delay said talent signal in a variable delay and to gain adjust said talent signal in delayed or undelayed form in a variable gain circuit thereby providing a cancellation signal, with the amount of at least one of said delay or gain responsive to said mix minus signal or said feedback signal or both;

said feedback signal and said cancellation signal being applied to a combining circuit to provide said mix minus signal with said feedback signal being applied without the use of a variable delay circuit.

Claim 3 (twice amended) A system for providing a mix minus signal from a delayed feedback signal and a talent signal including in combination:

a cancellation circuit responsive to said talent signal to delay said talent signal in a variable delay and to gain adjust said talent signal in delayed or undelayed form in a variable gain circuit thereby providing a cancellation signal, with the amount of said delay and gain automatically responsive to at least one of said mix minus signal and said feedback signal and;

said feedback signal and said cancellation signal being applied to a combining circuit to provide said mix minus signal with said feedback signal being applied without the use of a variable delay circuit.

Claim 4 A system as claimed in claim 1, 2 or 3 wherein said amount of said delay is responsive to said feedback signal and the amount of said gain is responsive to said mix minus signal.

Claim 5 (twice amended) A system as claimed in claim 1, 2 or 3 wherein said amount of said delay is responsive to said mix minus signal and the amount of said gain is responsive to said feedback signal.

Claim 6 A system as claimed in claim 1, 2 or 3 wherein said amount of said delay and said amount of said gain is responsive to said feedback signal.

Claim 7 (twice amended) A system as claimed in claim 1, 2 or 3 wherein said amount of said delay and said amount of said gain is responsive to said mix minus signal.

Claim 8 A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said mix minus signal and said talent signal wherein said talent signal is in delayed form.

Claim 9 A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said feedback signal and said talent signal wherein said talent signal is in delayed form.

Claim 10 A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said mix minus signal and said talent signal wherein said talent signal is in undelayed form.

Claim 11 A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said feedback signal and said talent signal wherein said talent signal is in undelayed form.

Claim 12 (amended) A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said mix minus signal and said talent signal wherein said talent signal has been gain adjusted in said variable gain circuit.

Claim 13 (amended) A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said feedback signal and said talent signal wherein said talent signal has been gain adjusted in said variable gain circuit.

Claim 14 (amended) A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said mix minus signal and said talent signal wherein said talent signal has been gain adjusted in said variable gain circuit.

Claim 15 (amended) A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said feedback signal and said talent signal wherein said talent signal has been gain adjusted in said variable gain circuit.

Claim 16 A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said feedback signal and said cancellation signal.

Claim 17 A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said mix minus signal and said cancellation signal.

Claim 18 A system as claimed in claim 1, 2 or 3 wherein said delay is automatically adjustable in response to changes in relative delay of said talent signal and the talent signal component of said feedback signal.

Claim 19 (twice amended) A system as claimed in claim 1, 2 or 3 wherein said delay is automatically adjusted in response to comparison of said feedback signal and said talent signal in undelayed form, and said gain is automatically adjusted in response to said mix minus signal and said talent signal in delayed form.

Claim 20 (twice amended) A method for providing a mix minus signal from a talent signal and a feedback signal having a variable amount of delay arising from its passage through a broadcast transmission including the steps of:

a) delaying said talent signal by a varying delay amount in response to said variable amount of delay;

b) providing a cancellation signal of a known level in response to said delayed talent signal;

c) changing said varying delay amount of said delay in step a) from time to time;

d) combining said feedback signal and said cancellation signal to provide said mix minus signal wherein said feedback signal is combined without additional variable delay beyond said variable amount.

Claim 21 (thrice amended) A method of providing a mix minus signal from a feedback signal and a talent signal which have a variable relative timing arising from a broadcast transmission, including the steps of:

a) delaying said talent signal by a varying delay amount in response to said varying relative timing;

b) adjusting the level of said talent signal in delayed or undelayed form and providing a cancellation signal in response to the delayed form thereof;

c) in said delaying step a) or said adjusting step b) or both, changing the amount of at least one of said varying delay amount or said level in responsive to said mix minus signal or said feedback signal or both;

d) providing said mix minus signal in response to said feedback signal and said cancellation signal wherein said feedback signal receives no variable delay beyond that as part of said broadcast transmission.

Claim 22 (twice amended) A method for providing a mix minus signal from a feedback signal from a broadcast transmission and a talent signal said signals having a relative delay which may vary due to said broadcast transmission, including the steps of:

a) delaying said talent signal by an varying delay amount responsive to said relative delay which may vary;

b) adjusting the level of said talent signal in delayed or undelayed form in a variable gain circuit and providing a cancellation signal in response to the delayed version thereof;

c) wherein in step a) said varying delay amount and in step b) said level are automatically responsive to at least one of said mix minus signal and said feedback signal and;

d) providing said mix minus signal in response to said feedback signal and said cancellation signal wherein said feedback signal suffers no variable delay beyond that as part of said broadcast transmission.

Claim 23 A method as claimed in claim 20, 21 or 22 wherein said varying delay amount of step a) is responsive to said feedback signal and said level of step b) is responsive to said mix minus signal.

Claim 24 (twice amended) A method as claimed in claim 20, 21 or 22 wherein said varying delay amount of step a) is responsive to said mix minus signal and said level of step b) is responsive to said feedback signal.

Claim 25 A method as claimed in claim 20, 21 or 22 wherein said varying delay amount of step a) and said level of step b) is responsive to said feedback signal.

Claim 26 (twice amended) A method as claimed in claim 20, 21 or 22 wherein said varying delay amount of step a) and said level of step b) is responsive to said mix minus signal.

Claim 27 A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to said talent signal in delayed form.

Claim 28 A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to a correlation of said feedback signal and said talent signal wherein said talent signal is in delayed form.

Claim 29 (twice amended) A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to said mix minus signal and said talent signal in undelayed form.

Claim 30 A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to said feedback signal and said talent signal wherein said talent signal is in undelayed form.

Claim 31 (amended) A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to said mix minus signal and said talent signal wherein said talent signal has been gain adjusted in said step b).

Claim 32 (amended) A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to a correlation of said feedback signal and said talent signal wherein said talent signal has been gain adjusted in said step b).

Claim 33 (amended) A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to a correlation of said mix minus signal and said talent signal wherein said talent signal has been gain adjusted in said step b).

Claim 34 (amended) A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to a correlation of said feedback signal and said talent signal wherein said talent signal has been gain adjusted in said step b).

Claim 35 A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to a correlation of said feedback signal and said cancellation signal.

Claim 36 A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to a correlation of said mix minus signal and said cancellation signal.

Claim 37 A method as claimed in claim 20, 21 or 22 wherein said varying delay amount of step a) is automatically adjustable in response to changes in relative delay of said talent signal and the talent signal component of said feedback signal.

Claim 38 (twice amended) A method as claimed in claim 20, 21 or 22 wherein said varying delay amount of step a) is automatically adjusted in response to comparison of said feedback signal and said talent signal in undelayed form, and said level of step b) is automatically adjusted in response to said mix minus signal and said talent signal in delayed form.

Claim 39 A method as claimed in claim 20, 21 or 22 wherein said delaying of step a) include pitch correction in order that the pitch of said talent signal remains constant as said delay is changed.

Claim 40 (amended) A system for providing a mix minus signal from a feedback signal having a relative delay with respect to a talent signal including in combination:

a cancellation circuit responsive to said talent signal to delay said talent signal in an amount set by a human operator and to gain adjust said talent signal in delayed or undelayed form in a variable gain circuit thereby providing a cancellation signal and;

a combining circuit responsive to said feedback signal and said cancellation signal to provide said mix minus signal.

Claim 41 (amended) A system as in claim 40 wherein said gain adjustment of said talent signal operates in a fashion such that said mix minus signal intentionally includes an audible residual amount of said talent signal.

Claim 42 (amended) A system as in claim 40 wherein said delay amount of said talent signal is automatically changed from said amount set by a human operator to the expected amount of said relative delay of said feedback signal with respect to said talent signal when said relative delay changes.

Claim 43 (amended) A system for providing a mix minus signal from a feedback signal delayed by a first amount relative to a talent signal including in combination:

a cancellation circuit responsive to said talent signal to delay said talent signal by an amount set by a human operator to the expected value of said first amount and to gain adjust said talent signal in delayed or undelayed form in a variable gain circuit thereby providing a cancellation signal and;

a combining circuit responsive to said feedback signal and said cancellation signal to provide said mix minus signal.

Claim 44 (amended) A system for providing a mix minus signal from a feedback signal delayed by a first amount relative to a talent signal including in combination:

a cancellation circuit responsive to said talent signal to delay said talent signal by an amount set by a human operator in response to the expected value of said first amount and to gain adjust said talent signal in delayed or undelayed form in a variable gain circuit thereby providing a cancellation signal, with the amount of said gain responsive to said mix minus signal or said feedback signal or both and;

a combining circuit responsive to said feedback signal and said cancellation signal to provide said mix minus signal.

Claim 45 (amended) A system as in claim 43 or 44 wherein said mix minus signal intentionally includes an audible residual amount of said talent signal which amount is responsive to human operator adjustment.

Claim 46 (amended) A method of providing a mix minus signal from a feedback signal which is delayed by a first amount and a talent signal [have a variable relative timing,] including the steps of:

a) delaying said talent signal by an amount set by a human operator in response to the expected value of said first amount;

b) adjusting the level of said talent signal in delayed or undelayed form and providing a cancellation signal in response to the delayed form thereof and;

c) providing said mix minus signal in response to said feedback signal and said cancellation signal.

Claim 47 (amended) A method as in claim 46 wherein step b) or c) or both operate in a fashion such that said mix minus signal intentionally includes a residual audible amount of said talent signal.

Claim 48 (amended) A method as in claim 46 wherein step a) includes automatically changing the amount of delay of said talent signal from said amount set by said human operator to said first amount.

Claim 49 (amended) A method for providing a mix minus signal from a feedback signal delayed by a first amount and a talent signal including the steps of:

a) delaying said talent signal by an amount set by a human operator in response[iv]e to the expected value of said first amount;

b) adjusting the level of said talent signal in delayed or undelayed form in a variable gain circuit and providing a cancellation signal in response to the delayed version thereof;

c) automatically varying said delay amount of step a) from said expected value to said first value and;

d) providing said mix minus signal in response to said feedback signal and said cancellation signal.

Claim 50 (amended) A method of providing a mix minus signal from a feedback signal delayed by a first amount and a talent signal including the steps of:

a) delaying said talent signal by a delay amount set by a human operator in response to the expected value of said first amount;

b) adjusting the level of said talent signal in delayed or undelayed form and providing a cancellation signal in response to the delayed form thereof;

c) in said delaying step a) or said adjusting step b) or both, automatically changing the amount of at least one of said delay amount or said level in responsive to at least one of said mix minus signal or said feedback signal and;

d) providing said mix minus signal in response to said feedback signal and said cancellation signal.

Claim 51 A method as in claim 49 or 50 wherein said mix minus signal intentionally includes a residual audible amount of said talent signal which amount is responsive to human operator adjustment.

Claim 52 A method as in claim 49 or 50 wherein in step c) includes automatically changing the amount of delay of said talent signal from said amount set by said human operator to said first amount after said delay of step a) is set by said human operator.

Claim 53 A method as in claim 49 or 50 wherein in step c) includes automatically changing the amount of delay of said talent signal from said amount set by said human operator to match said first amount in response to changes in said first amount.